In-Situ X-ray Characterization of Hydrogen Storage

The National Renewable Energy Laboratory and SLAC National Accelerator Laboratory seek a Postdoctoral Scholar for extensive X-ray based characterization of adsorbant-based hydrogen storage materials. The objective is to provide fundamental insights into the materials properties and stability, and the sites and mechanisms for hydrogen adsorption. Boron doped carbon and covalent organic frameworks will form the initial materials focus as they are promising alternatives for hydrogen storage. Realizing their theorized hydrogen storage potential requires a robust understanding of the material chemical and structural properties, and importantly, the mechanism(s) of hydrogen adsorption.

This is an NREL postdoc with a full-time field assignment at SLAC working primarily at the Stanford Synchrotron Radiation Lightsource (SSRL). The two-three year postdoctoral position will involve the use of in-situ (under relevant temperatures and hydrogen pressures) and some ex-situ X-ray scattering (diffraction and small angle scattering), X-ray absorption spectroscopy (XAS) and X-ray Raman scattering (XRS) to investigate in B-doped carbon (BCx) and covalent organic frameworks (COFs), the materials properties and stability, and the hydrogen adsorption mechanisms. The X-ray based instigations will be complemented by in situ and ex situ characterization at NREL. For BCx, the goals are to determine the structural effect of boron incorporation into graphitic carbon, the hydrogen adsorption sites, and how hydrogen adsorption/desorption affects structure and structure stability. For COFs, the goals are to determine the COF structure of as synthesized fluorinated COFs as a function of fluorine and hydroxyl incorporation, and the effect of hydrogen adsorption/desorption on COF structure.

Qualifications:

- Ph.D. in physics, materials sciences, chemistry, or related fields.
- experience with synchrotron X-ray and/or neutron scattering, or X-ray absorption spectroscopy.
- Strong experimental, analytical and computation skills.
- effective written and verbal communication skills.
- ability to work and communicate effectively with a diverse population; good interpersonal skills are essential.
- ability to work independently and in a team environment.

Please send a letter with CV and list of publications to Tom Thomas.Gennett@nrel.gov with copy to Mike Toney, email: mftoney@slac.stanford.edu